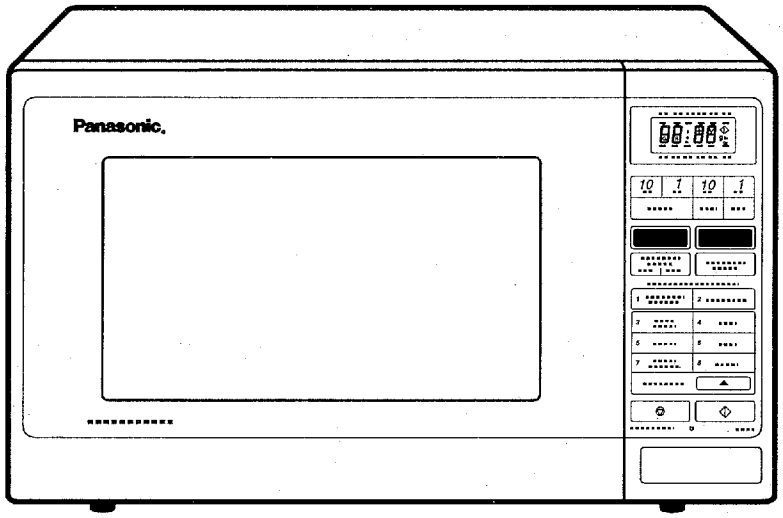
ORDER NO. MOD9604097C2

Service Manual

Microwave Oven

NN-K456



Specifications

Power Source :		220 V AC Single Phase 50 Hz
Power Requirement :		Microwave : 1,350 W
Output :	Microwave	850 W (IEC705)
	Heater	1,100 W
Microwave Frequency :		2450MHz
Timer :		99 min. 99 sec.
Outside Dimensions :		306 mm (H) × 510 mm (W) × 385 mm (D)
Oven Cavity Dimensions :		200 mm (H) × 330 mm (W) × 330 mm (D)
Weight :		17.5 kg
Specifications subject to change without notice.		

Panasonic

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

* This product should be serviced only by trained, qualified personnel.
  This service manual covers products for following markets.
  When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.
  ZPG····· For CIS

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FEATURE CHART

MODEL / FEATURE	NN-K456
THREE STAGE COOKING	○
GRILL	○
COMBINATION	○
AUTO DEFROST	○
AUTO REHEAT	○
ONE TOUCH MENU	1-5: Microwave 6-8: Combination ○
DELAY/STAND	○
DIGITAL CLOCK	○

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CONTROL PANEL

Display Window

Time Pads

Microwave Power Pad

Grill Power Pad

Auto Defrost Pads

Clock Pad

Timer Pad

Combination Pads

Auto Reheat Pad

One Touch Menu Category Pads
1 - 5: by Microwave
6 - 8: by Combination

Weight Adjustment Pad

Stop/Cancel Pad:
Before cooking: one press clears your instructions.
During cooking: one press temporarily stops the cooking program. Another press cancels all your instructions and the time of day or colon will appear in the display.

Start Pad:
By pressing Start Pad the oven starts operating.
If during cooking the door is opened or Stop/Cancel Pad is pressed once, Start Pad has to be pressed again to continue cooking.

OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

1. To Set Clock

OPERATION	DISPLAY
1. Plug the power supply cord into wall receptacle.	88:88
2. Press Clock pad.	✳
3. Enter time of day (TOD) by pressing appropriate 10 1 10 1 pads.	11✳25
4. Press Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	11:25

2. Time Cooking For Two Stage

OPERATION	DISPLAY
1. Place a water load in the oven.	
2. Press Micro Power pad once for High power. (1st stage)	10 1 ✳ Hi
3. Set for 5 seconds by pressing appropriate 10 1 10 1 pad.	5 ✳ Hi
4. Press Micro Power pad 4 times for Med power. (2nd stage)	10 1 ✳ Med
5. Set for 1 minute by pressing appropriate 10 1 10 1 pad.	1:00 ✳ Med
6. Press Start pad.	5 ✳ Hi
7. When first stage cooking time has elapsed, oven automatically switches to 2nd stage cooking.	1:00 ✳ Med
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	TOD reappears in the display window.

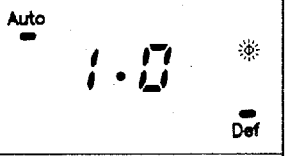
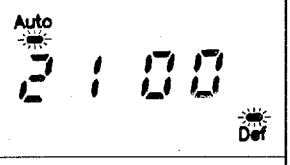
3. Grill

OPERATION	DISPLAY
1. Press Grill pad.	10 1 ✳ G R
2. Set cooking time for 30 minutes by pressing 10 1 10 1 pad.	Grill 30:00 ✳
3. Press Start pad.	Grill ✳ 30:00

4. Combination cooking

OPERATION	DISPLAY
1. Press Combination 1 pad.	Comb 10 1 ✳ 1
2. Set cooking time for 30 minutes by pressing 10 1 10 1 pads.	Comb 30:00 ✳
3. Press Start pad.	Comb ✳ 30:00

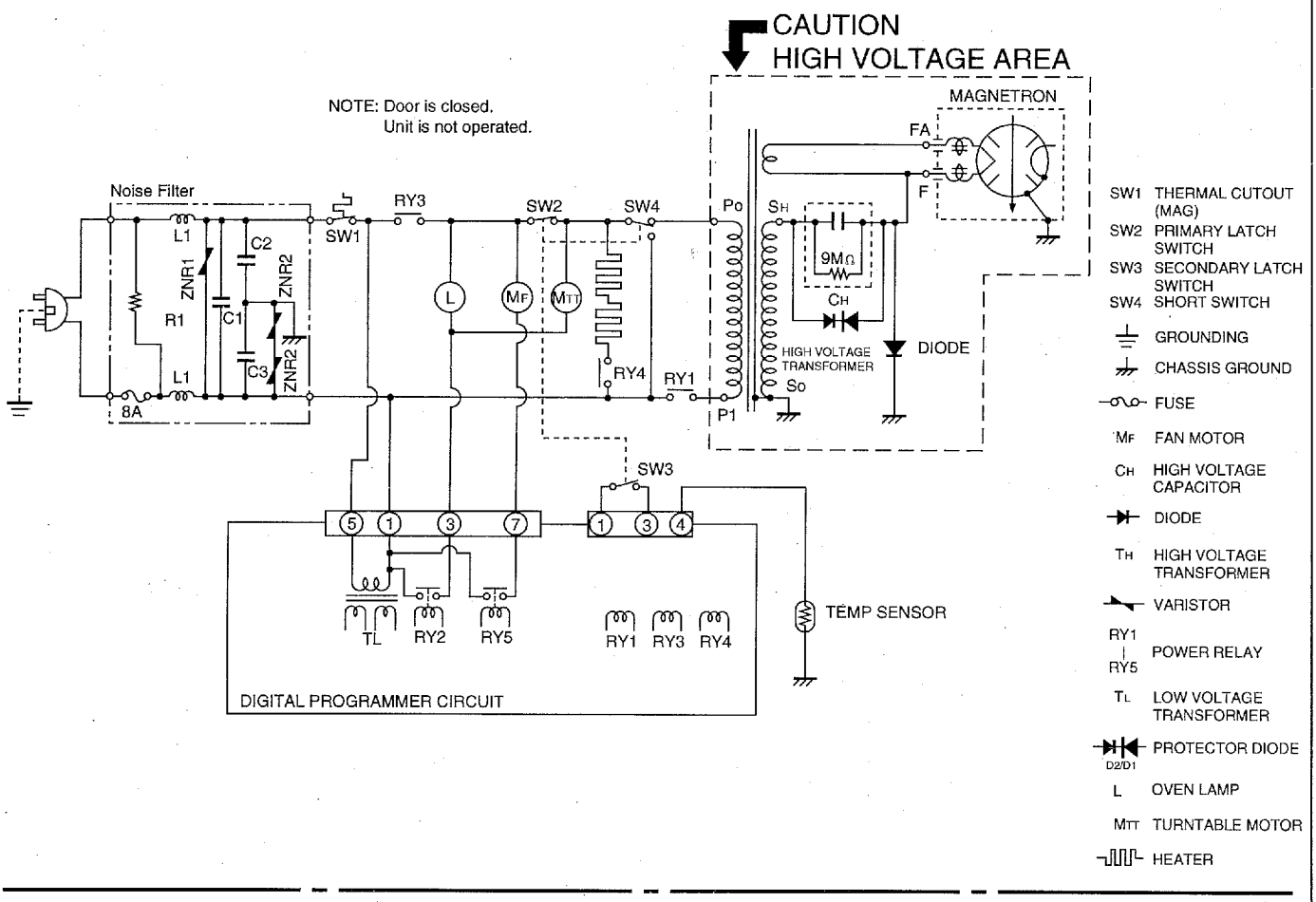
5. Auto Defrost

OPERATION	DISPLAY
1. Press Auto Defrost 1.0 kg Pad once to set 1.0 kg.	
2. Press Start Pad.	
3. Press Stop/Reset Pad twice Oven shuts off.	TOD reappears in the display window.

6. One Touch Menu Cooking

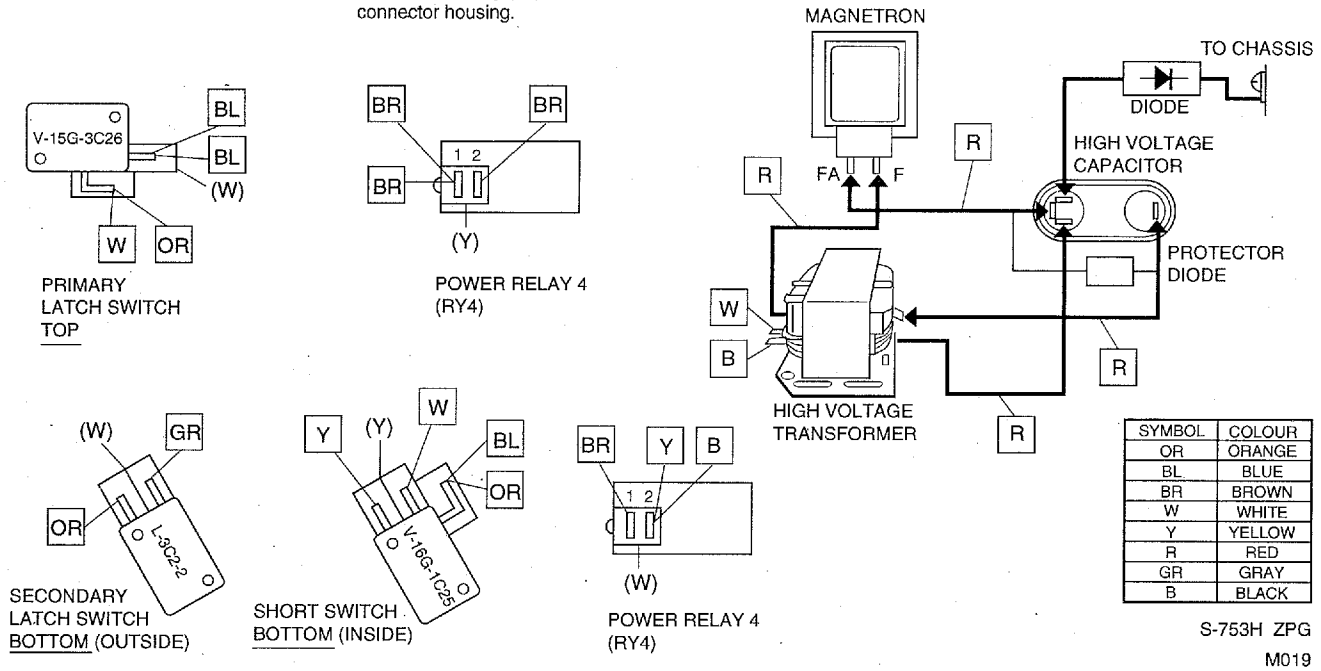
OPERATION	DISPLAY
1. Press Vegetables pad three time to set weight 400 g.	
2. Press Start pad.	

SCHEMATIC DIAGRAM



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
*Colours shown by ( ) indicate colours of lead wire connector housing.



SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

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DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay 1 (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay 1 contacts in order to vary the output power of the microwave oven from "Low" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds.

The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE 1: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

2: If microwave cooking is over 10 minutes, fan motor rotates for 1 minute after cooking to cool oven.

POWER SETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY 1 (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	55%	13	9
MEDIUM-LOW	30%	8	14
LOW	10%	4	18
DEFROST	APPROX. 250W	Please refer to description of cyclic defrost	

2. Cyclic defrost

When defrost power and defrosting time is selected and Start pad is touched:

(A) The digital programmer circuit (DPC) divides the total defrosting time into 8 equal periods, consisting of four defrosting periods, each followed by a standing period.

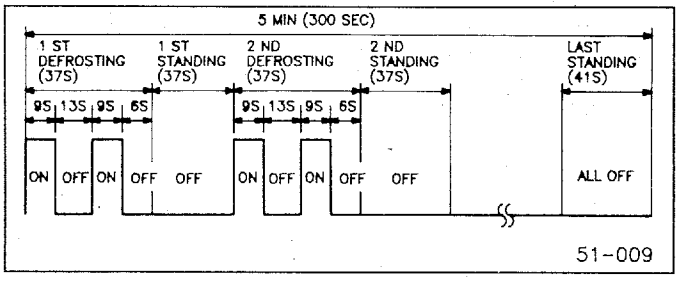
(B) During defrosting power periods, power relay 1 is energized for 9 seconds and de-energized for 13 seconds by DPC.

(C) During Standing periods, power relay 1 is always open resulting in no microwave power.

NOTE: Defrost time selected is converted into seconds by the DPC but display will show selected time in minutes and seconds as programmed. The total number of seconds is divided into 8 time periods. The remainder (seconds not equally divisible by 8) are added to the last standing time period.

Example: If Defrosting time is selected for 5 minutes, each operating period will be as follows :
5 minutes = 300 seconds
300/8 = 37 and remainder is 4 seconds.
The 4 seconds is added to the last time period.

NOTE: When defrosting time is selected for not more than 7 seconds, the power relay 1 will not be energized at all.



Combination No.	HEATER (RY4)		Microwave (RY1)	
	ON (SEC)	OFF (SEC)	ON (SEC)	OFF (SEC)
1	21	12	12	21
2	15	18	18	15

3. Grill cooking

The digital programmer circuit generates the power relay 4 control signal at ON time during grill cooking.

4. Combination cooking

Combination cooking is accomplished by microwave and grill cooking.
The digital programmer circuit controls ON-OFF time of power relay 1 and 4 as shown in the table.

NOTE: After grill and combination cooking, fan motor rotates for 1 minute to cool oven and electric components.

5. Auto Defrost, One Touch Menu and Auto Reheat Control

When those auto control feature is selected and Start pad is pressed:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display.
The table shows the corresponding cooking times for respective weights by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

NOTE: After one touch menu and auto reheat cooking, fan motor rotates for 1 minute to cool oven and electric components.

CATEGORY	SELECTED WEIGHT	TOTAL COOKING TIME
Auto Defrost	1.0 kg	21 Min. 00 Sec
Vegetables	400 g	4 Min. 00 Sec
Beef/Lamb	1.0 kg	23 Min. 00 Sec

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. When the 8A 250V fuse is blown due to the operation of short switch:

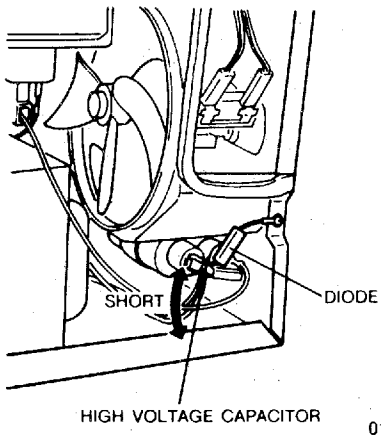
WARNING

When the 8A 250V. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 1 (RY1) when the continuity check reads shorted contacts (1-2).

(A) This is mandatory. Refer to "Adjustments and Measurement" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



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Touch chassis side first then short to the high voltage capacitor terminal.

6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.
(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

CAUTION
MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

1. The following components have potentials above 250V while the appliance is operated.
   ※ Magnetron
   ※ High voltage transformer
   ※ High voltage diode
   ※ High voltage capacitor
   ※ Protector diode
   Pay special attention on these portions.
2. When the appliance is operated with the door hinge or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/cm². After repair or exchange, it is very important to check if magnetron and the door hinge is correctly fixed.

DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

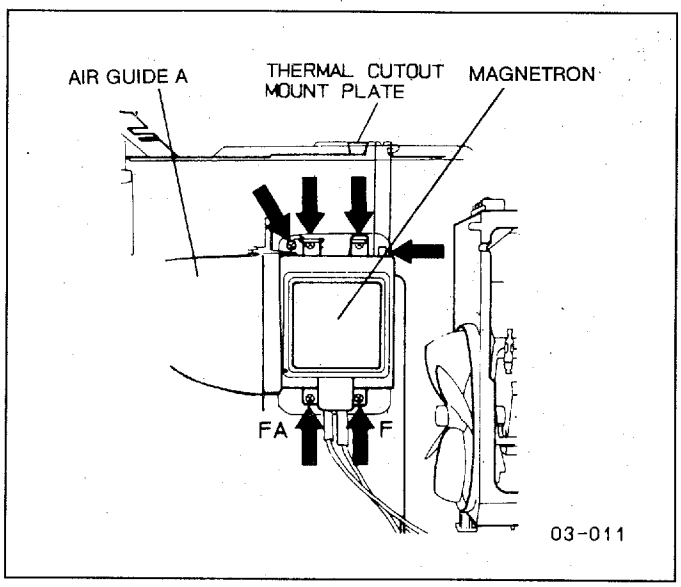
1. Magnetron

(A) Discharge the high voltage capacitor.
(B) Remove 1 screw holding thermal cutout mount plate.
(C) Remove 1 screw holding air guide A.
(D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
(E) Remove 4 screws holding the magnetron.

NOTE: After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".



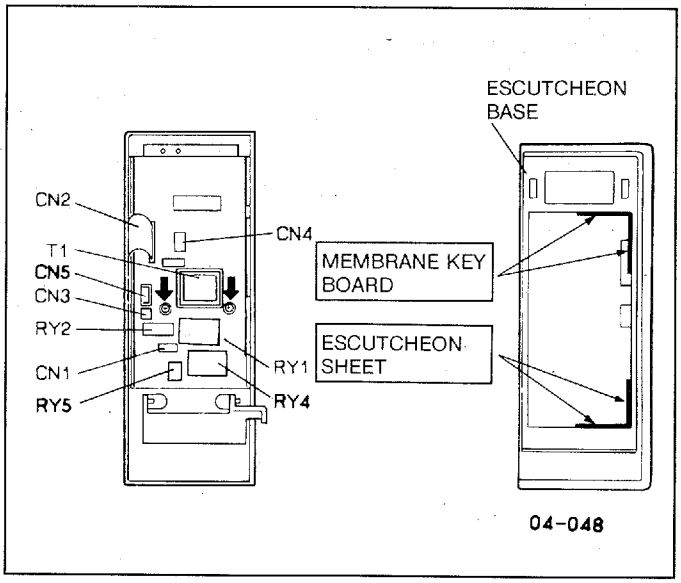
2. Digital programmer circuit (DPC) and membrane key board.

NOTE: Be sure to ground any static electric charge built up on your body, before handling the DPC.
(A) Disconnect all connectors from D.P.C.
(B) Remove 2 screw holding escutcheon base and slide the escutcheon base upward slightly.
(C) Release CN2 connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
(D) Remove 2 screws holding DPC.

To replace membrane key board

(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) Peel off the tub of membrane key board from escutcheon base.
(G) Peel off display filter from escutcheon base.
(H) Push the upper part of key board (display window portion) from back of escutcheon base and peel off membrane key board completely from escutcheon base.

NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using of hair dryer is recommended for smoother removal.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Alignment position of membrane key board and escutcheon sheet are as follows (See figure);
Membrane key board: Right and upper edges
Escutcheon sheet: Right and lower edges



3. Low voltage transformer and/or power relays

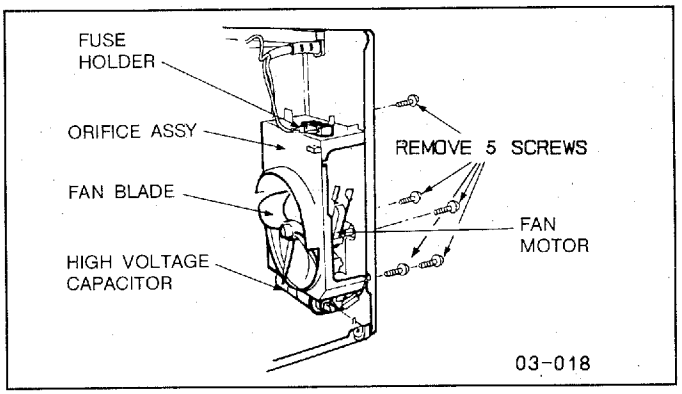
NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.
(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

4. Fan motor

(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 2 lead wires from fuse holder terminals.
(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
(D) Remove 5 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
(E) Remove fan blade from the fan motor shaft by pulling it straight out.
(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.

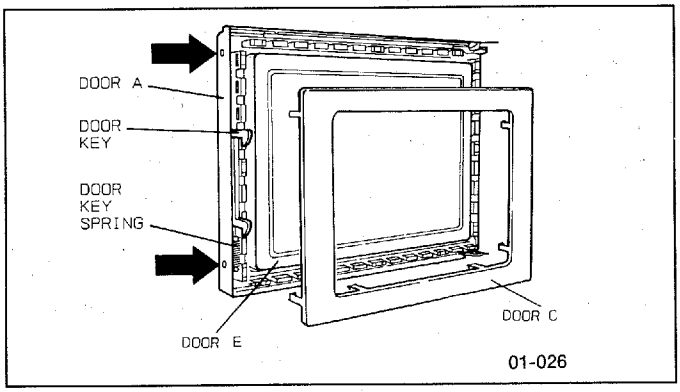


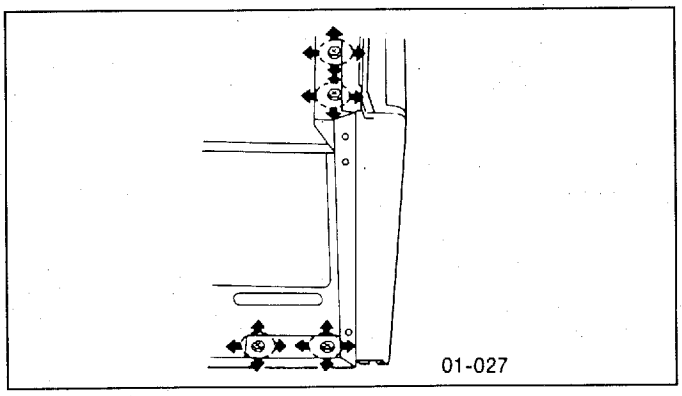
5. Door assembly

(A) Open the door and remove door C from door E by carefully pulling outward starting from upper right hand corner.
(B) Remove door key and door key spring.
(C) Remove 2 screws holding side frames of door A.
(D) Separate the door A from the door E by freeing catch hooks on the door A using a flat screwdriver.

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

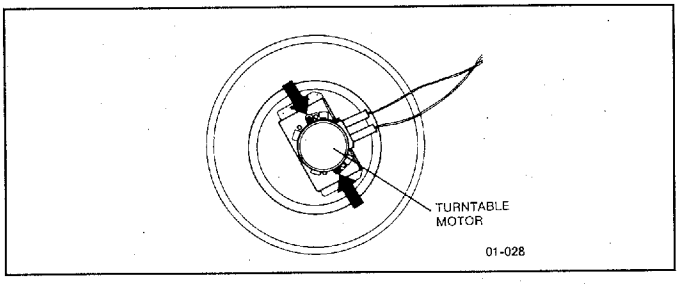
(1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
(2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave may leak from the clearance between the door and oven.





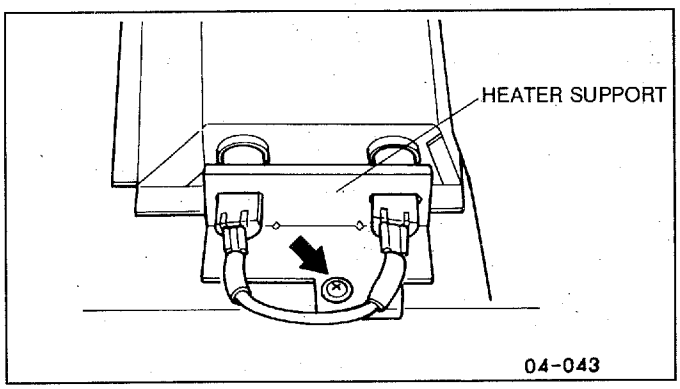
6. Turntable motor

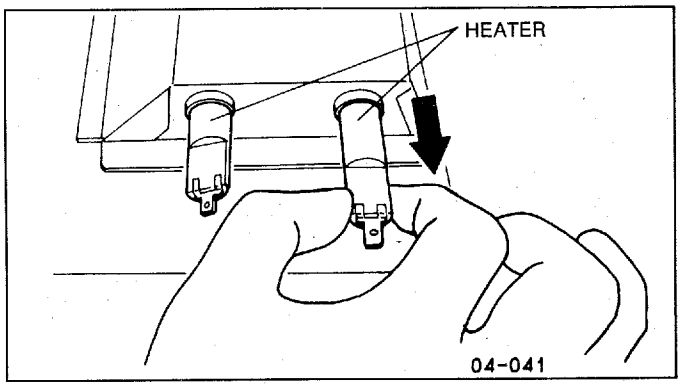
(A) Remove 2 screws holding motor cover.
(B) Disconnect 2 lead wires from turntable motor.
(C) Remove 2 screws holding turntable motor.



7. Quartz heater

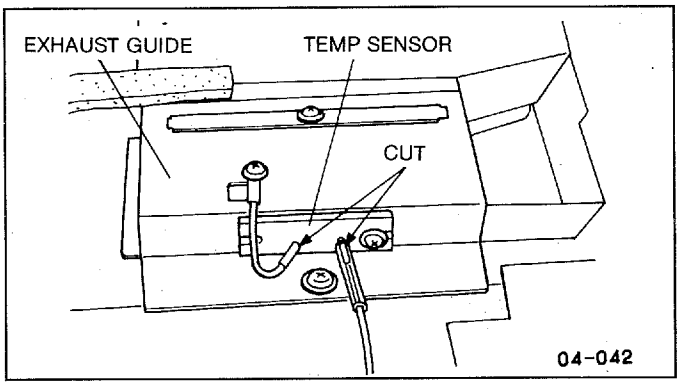
(A) Disconnect lead wires from heater terminals.
(B) Remove 1 screw holding heater support.
(C) Remove the heater by pulling it out.





8. Temp sensor (thermal protector)

(A) Cut lead wire at the top of sensor terminals.
(B) Remove 1 screw holding the temp sensor and replace with new one.
(C) Solder the lead wires securely to the sensor terminals.



COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

1. High voltage transformer

(A) Remove connections from the transformer terminals and check continuity.

(B) Normal (cold) resistance readings should be as follows:

Secondary winding	Approx. 80Ω~120Ω
Filament winding	Approx. 0Ω
Primary winding	Approx. 0Ω~ 3Ω

2. High voltage capacitor

(A) Check continuity of capacitor with meter on highest OHM scale.

(B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.

(C) A shorted capacitor will show continuous continuity.

(D) An open capacitor will show constant 9MΩ.

(E) Resistance between each terminal and chassis should be infinite.

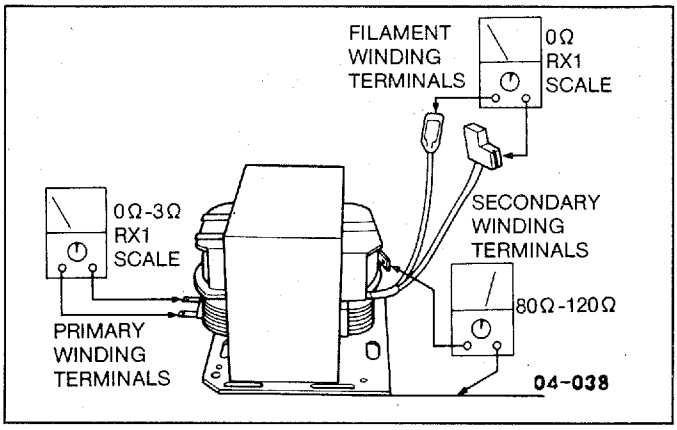
3. Magnetron

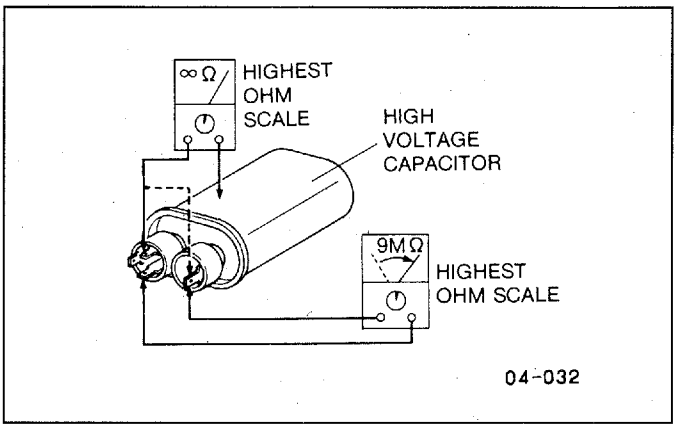
Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

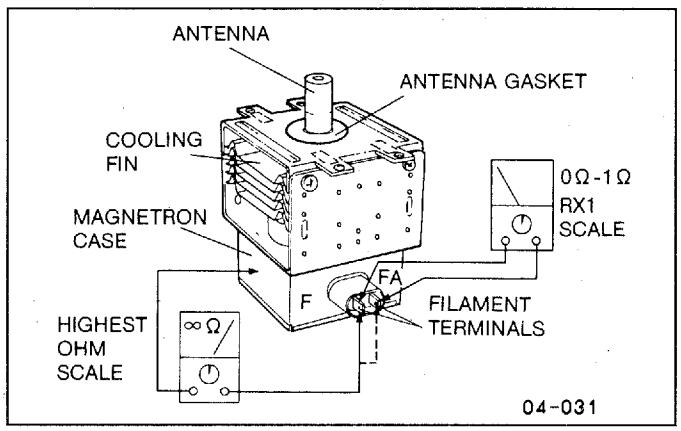
(A) Isolate magnetron from the circuit by disconnecting the leads.

(B) A continuity check across magnetron filament terminals should indicate one ohm or less.

(C) A continuity check between each filament terminal and magnetron case should read open.

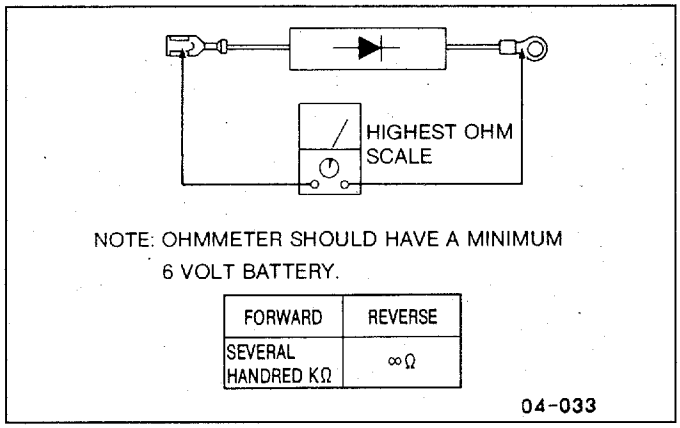






4. Diode

(A) Isolate the diode from the circuit by disconnecting the leads.
(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.
A normal diode's resistance will be infinite in one direction and several hundred kΩ in the other direction.

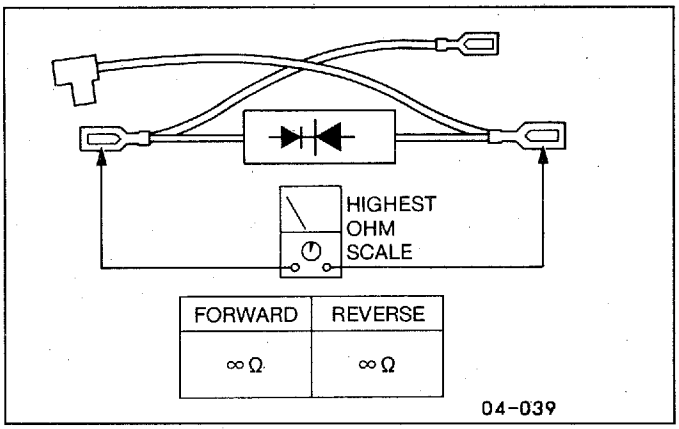


5. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

6. Protector diode

(A) Isolate the protector diode assembly from the circuit by disconnecting its leads.
(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the protector diode terminals.
Reverse the meter leads and again observe the resistance reading.
A normal protector diode's resistance will be infinite in both directions.
It is faulty if it shows continuity in one or both directions.



7. Temp sensor (Thermal protector)

A temp sensor is mounted on exhaust guide. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason. The thermal protector will operate at 257°F (125°C).
The device is connected to the DPC on touch control models. When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display wil go to reset mode.
The cooking program can be reset after cool-down.

THERMISTOR RESISTANCE VALUE
30K-120K at 10°C-30°C (50°F-86°F)

MEASUREMENTS AND ADJUSTMENTS

1. Adjustment of Primary latch switch, Secondary latch switch and short switch

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in table.

NOTE: No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in table so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

2. Measurement of microwave output

The output power of magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

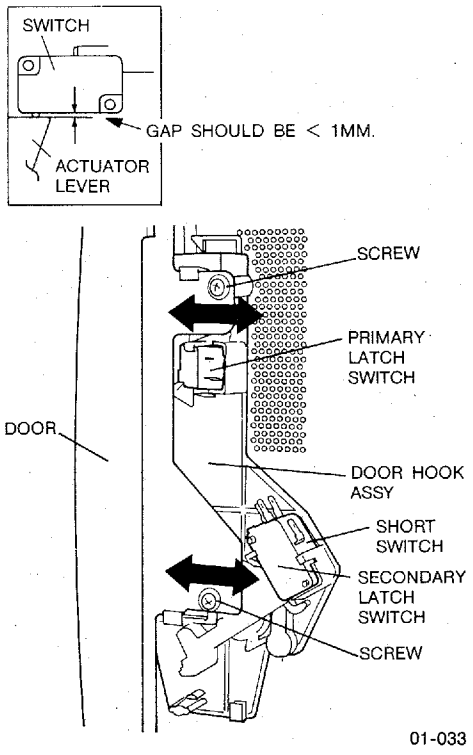
NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate.
Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

(D) The normal temperature rise at High power position for each models is as shown in table.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 1.0mm when the door is closed.

TABLE (1 ℓ -1min. test)

OUTPUT	TEMPERATURE RISE
850W	Min. 7.5°C

TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot by removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. AC is present at the shaded area ▩ of the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

[TROUBLE 1] Oven does not start cooking

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness	
		2. Open thermal cutout (Magnetron)	Check fan motor when thermal cutout is defective.
		3. Open low voltage transformer 4. Defective DPC	
2.	Oven does not accept key input (Program)	1. Key input is not in-sequence	Refer to operation procedure.
		2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board	
		4. Defective DPC	Refer to DPC troubleshooting.
3.	Oven lamp and turntable motor turn on when oven is plugged in with door closed.	1. Misalignment or loose wiring of secondary latch switch.	Adjust door and latch switches.
		2. Defective secondary latch switch	
4.	Timer starts count down but no microwave oscillation.	1. Off-alignment of latch switches	Adjust door and latch switches.
		2. Defective primary latch switch 3. Defective short switch 4. Open or loose wiring of power relay 1 (RY1) 5. Defective power relay 1 (RY1) 6. Defective DPC. 7. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and causing magnetron to lower output and/or intermittent oscillation.	
		8. Defective high voltage component H.V. Transformer H.V. Capacitor H.V. Diode Magnetron	Check high voltage component according to component test procedure and replace if it is defective.

[TROUBLE 2] Fuse is blown

	SYMPTOM	CAUSE	CORRECTIONS
1.	8A fuse is blown.	1. Shorted lead wire harness	
		2. Defective short switch	Check adjustment of latch switches and door
		3. Defective primary latch switch	
		4. Shorted H.V. Capacitor	
		5. Shorted H.V. Diode	Replace H.V. Diode and protector diode (*NOTE)
		6. Defective magnetron	Replace magnetron and protector diode (*NOTE)
		7. Shorted H.V. Transformer	Replace H.V.Transformer and protector diode (*NOTE)
		8. Shorted Protector diode	
		9. Shorted heater	
		10. Defective power relays	
		11. Defective DPC	
		※NOTE: Be sure to replace protector diode together with those H.V.Components. In this case, only D2 of protector diode may be shorted due to faulty H.V.Component. Therefore, if protector diode is not replaced together, high voltage transformer will be damaged (over heated).	

[TROUBLE 3] Other troubles

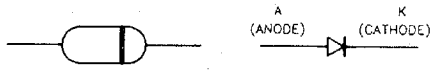
	SYMPTOM	CAUSE	CORRECTIONS
1.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage	Consult electrician
		2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation)	
		3. Aging change of magnetron	
2.	Turntable motor and oven lamp turn on when door is opened.	1. Shorted primary latch switch	
3.	Oven does not operate and "88:88" appears in display.	1. Open or loose wiring of temp sensor	Check tighten screws on escutcheon base bracket, D.P.C. board and temp sensor.
		2. Defective temp sensor	
		3. Defective DPC	Refer to DPC troubleshooting.
4.	Loud buzzing noise can be heard.	1. Loose fan and fan motor	
		2. Loose screws on H.V. Transformer	
5.	Oven stops operation during cooking	1. Off-alignment of latch switches	Adjust door and latch switches.
		2. Open or loose wiring of primary and secondary latch switch	
		3. Operation of thermal cutout (Magnetron)	
6.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor	
		2. Defective turntable motor	

(TROUBLE 4) Trouble related to Digital programmer circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No Display when oven is first plugged in	1	Fuse pattern of DPC	Normal	STEP 2
			Open	Shorted circuit of ZNR, L. V. T., Oven Lamp, etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 34 voltage (Emitter of Q1)	Abnormal	ZD1,Q1
			Normal = 5V	→ Step 4
	4	IC-1 pin 36 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal	→ IC-1, CX1, DISPLAY
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 25 voltage	Abnormal	IC-1
			Normal	BZ
Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 3 voltage while operation	Abnormal	IC-1
			Normal = 5V	→ Step 2
	2	short circuit between pin 1 and pin 12 of IC-2	Still not turn on	RY-2
			RY-2 turns on	IC-2
No microwave oscillation at any power setting	1	IC-1 pin 6 and pin 14 voltages while operation at high power	Abnormal	IC-1
			Normal 6---5V, 14---5V	→ Step 2
	2	Q4 transistor	Abnormal	Q4
			Normal	IC-2, RY-1, Q3
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY

HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

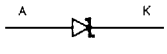
Diode



	FORWARD	REVERSE
A-K	SMALL	∞

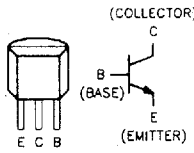
Transistor

NPN Transistor



2SC·····

2SD·····

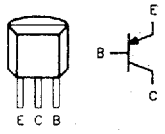


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

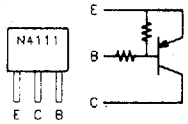
2SB·····



	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

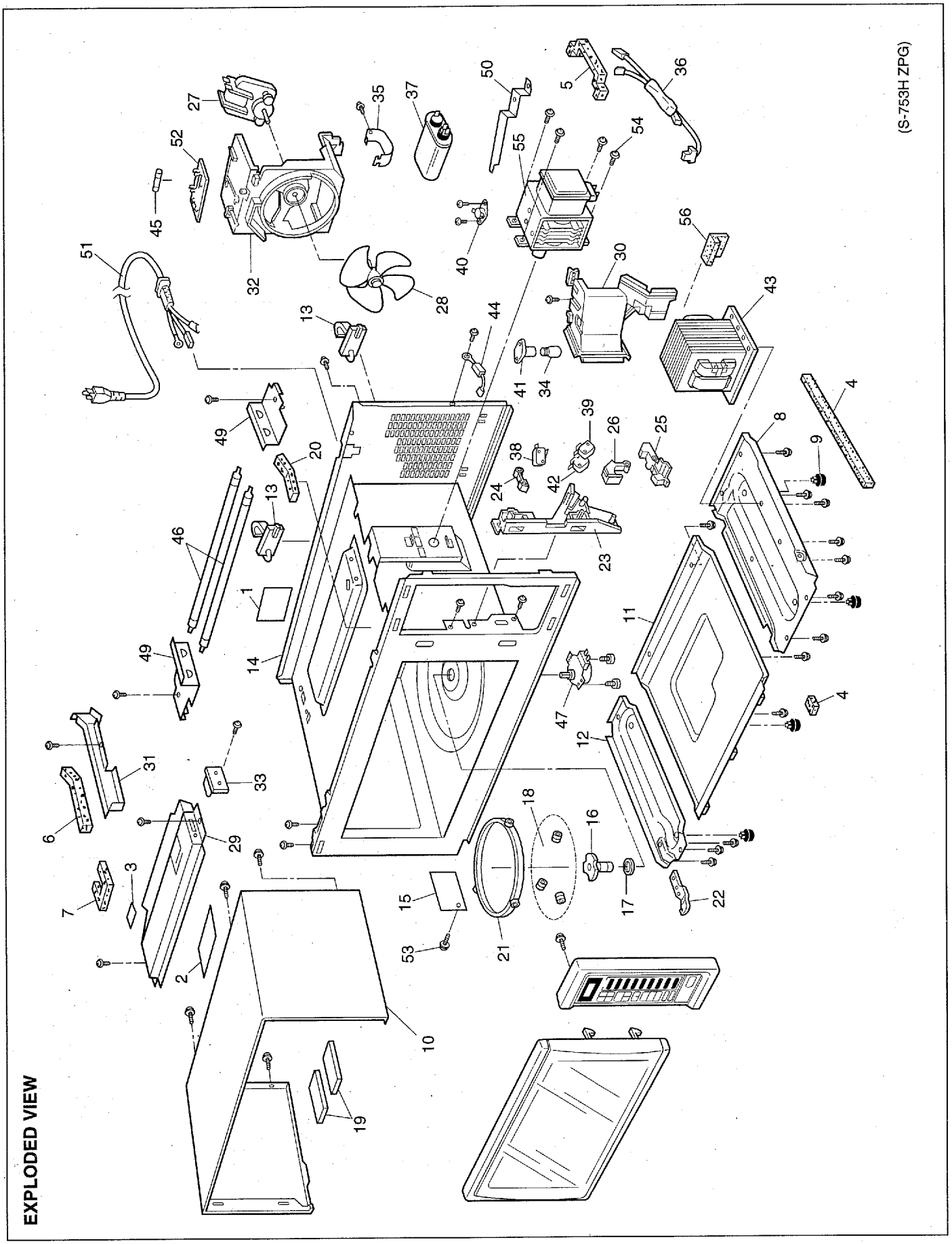
Digital Transistor

PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ~30kΩ	10kΩ~30kΩ
C-B	50kΩ~90kΩ	∞
C-E	40kΩ~80kΩ	∞

EXPLODED VIEW AND PARTS LIST



PARTS LIST

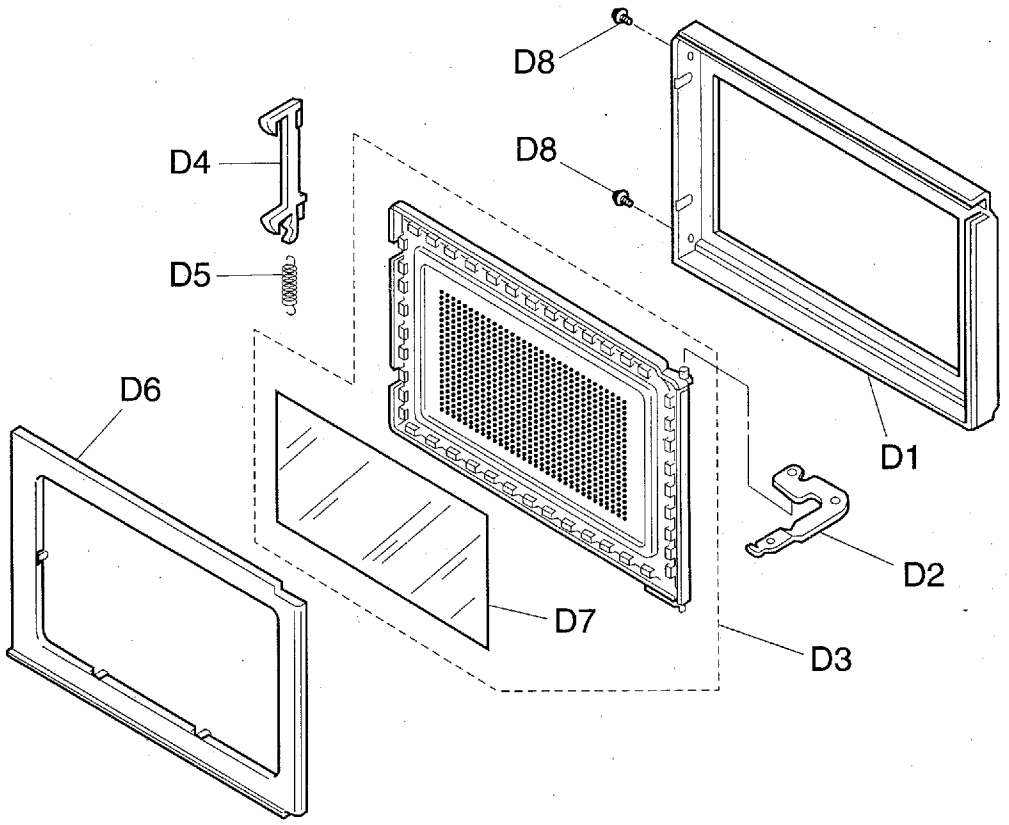
NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.
2: Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
3: Items marked ※ supplied by MELUK.

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
1		A00066000ZP	CAUTION LABEL	1	
2		A01505870GS	CAUTION LABEL	1	
3		A04907530HN	HEATER LABEL	1	
4		ANE000Z000AA	CUSHION RUBBER A	2	
5		ANE0912000AF	CUSHION RUBBER B	1	
6		ANE0963000AK	CUSHION RUBBER D	1	
7		ANE0963000AN	CUSHION RUBBER D	1	
8		A10016520GP	BASE	1	
9		ANE1008-3W0	RUBBER FOOT	4	
10		A10096520HXN	CABINET BODY (U)	1	
11		A10266520GP	BASE C	1	
12		A11296520GP	BASE B	1	
13		A11405840GP	STOPPER	2	
14		A200A7530HN	OVEN	1	
15		A20556520GP	COVER	1	
16		A21315870GP	PULLEY SHAFT	1	
17		ANE2177-F80	WASHER	1	
18		A202K5870GP	ROLLER B (U)	1	(NOTE 4)
19		A22586520GP	ADIABATIC MATERIAL	2	
20		A22587530HN	ADIABATIC MATERIAL	1	
21		A290D5870GP	ROLLER RING (U)	1	
22		A30077050AP	LOWER HINGE	1	
23		A3020-1200	DOOR HOOK	1	
24		A3136-1200	HOOK SPACER A	1	
25		A31374650AP	HOOK SPACER B	1	
26		A31384650AP	HOOK SPACER C	1	
27	⚠	A400A4760JP	FAN MOTOR	1	(AC,26W,SINGLE)
28		ANE40086W0AP	FAN	1	
29		A40247530HN	EXHAUST GUIDE	1	
30		A40254760JP	AIR GUIDE A	1	
31		A40266520GP	AIR GUIDE B	1	
32		A41445540AP	ORIFICE	1	
33	⚠	A601L5150AP	TEMP SENSOR	1	
34		A60304080BP	INCANDESCENT LAMP	1	(20W,240V)
35		A60374760GP	CAPACITOR BRACKET	1	
36		A606V4760JP	PROTECTOR DIODE	1	
37	⚠	A60904080GP	H.V.CAPACITOR	1	(1.14MF,AC2100V)
38	⚠	ANE6142-F60	MICROSWITCH	1	(V-15G-3C26) PRIMARY LATCH SWITCH
39	⚠	A61425180AP	MICROSWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
40	⚠	A61454000AP	THERMAL CUTOUT	1	
41	⚠	A61524000AP	SOCKET	1	
42		ANE6161-3X0	MICRO SWITCH	1	(V-16G-1C25) SHORT SWITCH
43	⚠	A620A5750GP	H.V.TRANSFORMER	1	(1.5KVA)
44		A62024000AP	DIODE,SI	1	
45	⚠	ANE6230Z70BP	FUSE	1	(8A)
46	⚠	A630G7530HN	HEATER A	2	
47	⚠	A63264760JP	TURNTABLE MOTOR	1	(3W)
48		A63847530HN	PROTECTING SHEET	1	
49		A64607530HN	HEATER MOUNTING PLATE	2	
50		A66266520GP	THERMAL CUTOUT MOUNT	1	

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
51		A900C5540EP	AC CORD W/PLUG	1	(240V)
52		A692Y5540BP	NOISE FILTER (U)	1	
53		XST4+5VS	SCREW	1	4X5 (FOR COVER)
54		XTWANE4+10RU	SCREW	4	4X10 (FOR MAGNETRON)
55		2M210-M1E	MAGNETRON	1	
56		ANE0911000AE	CUSHION RUBBER B	1	
※		E08877050AP	CAVITY SPRAY PAINT	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
※		E08877000AP	TOUCH-UP PAINT	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY

NOTE 4 : When ordering the roller B assy, three rollers will be shipped.
When replacing the roller B, three rollers should be replaced at the same time.
Otherwise the glass cooking tray may not tuun smoothly.

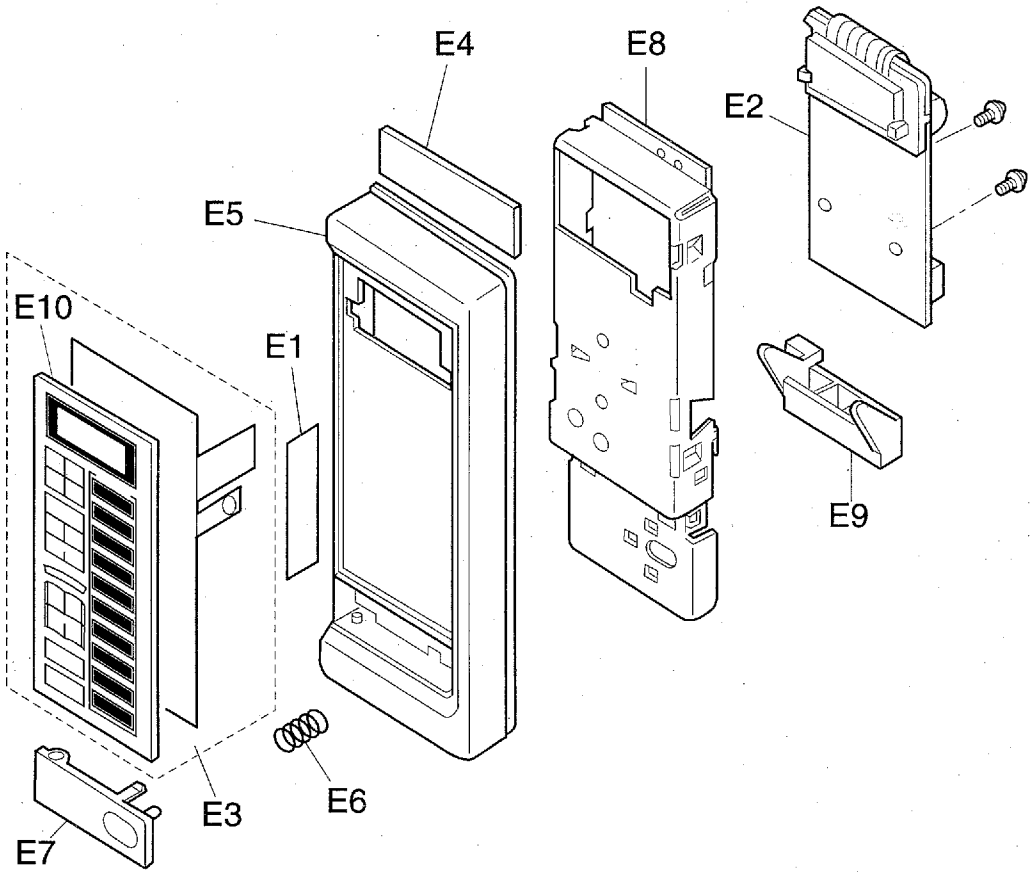
DOOR ASSEMBLY



(S-753H ZPG)

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
D1		A302A7530HZP	DOOR A (U)	1	
D2		A30067300AP	UPPER HINGE	1	
D3		A302K7200AP	DOOR E (U)	1	
D4		A30184650AP	DOOR KEY	1	
D5		A30214000AP	DOOR KEY SPRING	1	
D6		A30857200AP	DOOR C	1	
D7		A31457200AP	DOOR SCREEN A	1	
D8		XTBANE3+8BC	SCREW	2	3X8

ESCUTCHEON BASE ASSEMBLY

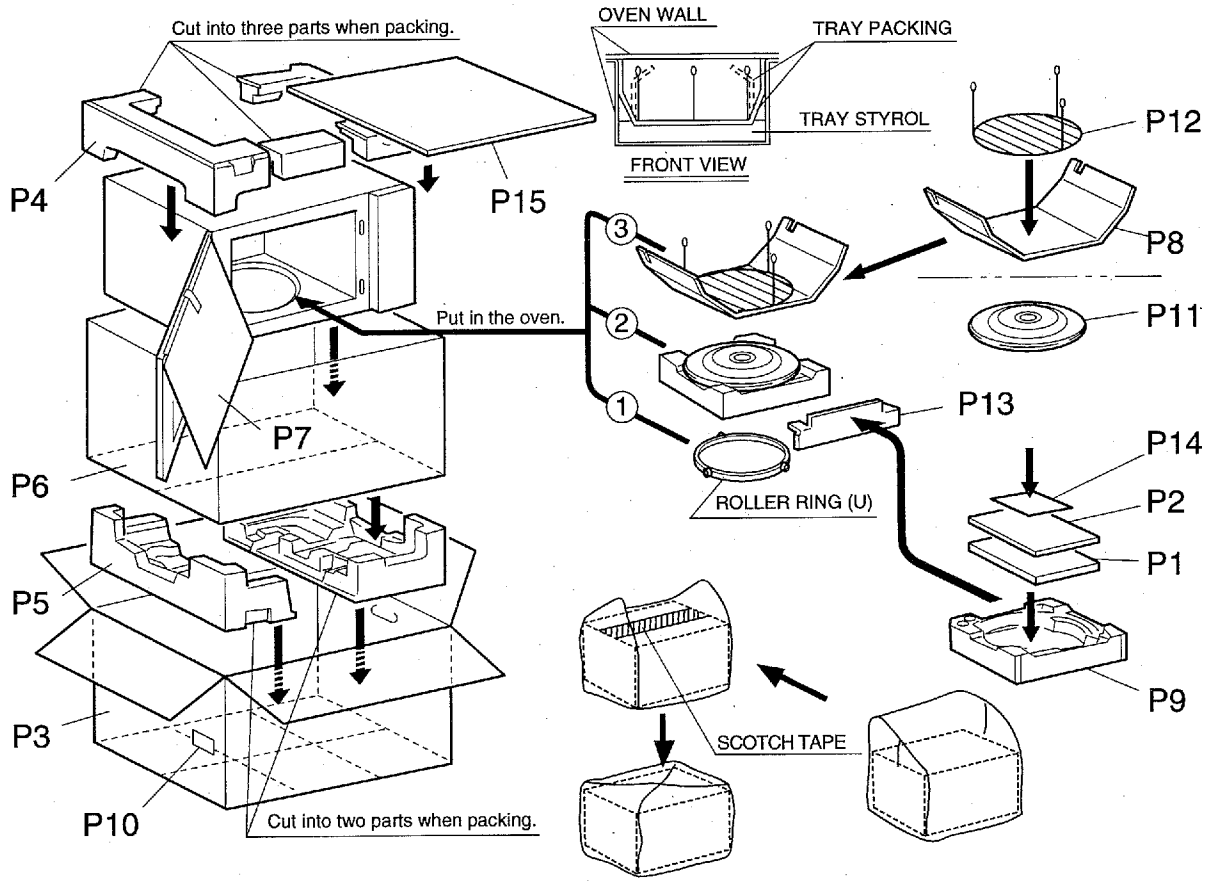


(S-753H ZPG)

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
E1		A01577530HZP	NAME PLATE	1	
E2	⚠	A603L6520ZP	D.P.CIRCUIT (U)	1	RTL (W/COMPONENT)
E3	⚠	A630Y7530HZP	MEMBRANE SWITCH (U)	1	(W/ESCUTCHEON SHEET)
E4		A80025540AP	ESCUTCHEON B	1	
E5		A80347080HAP	ESCUTCHEON BASE	1	(NOTE 5)
E6		ANE80378A0AG	COOK BUTTON SPRING	1	
E7		A80727010HAP	DOOR OPENING BUTTON	1	
E8		A81277050ZP	BACK PANEL	1	
E9		A82567010AP	DOOR OPENING LEVER	1	
E10		A83377530HZP	ESCUTCHEON SHEET	1	

NOTE 5 : Please order name plate together.

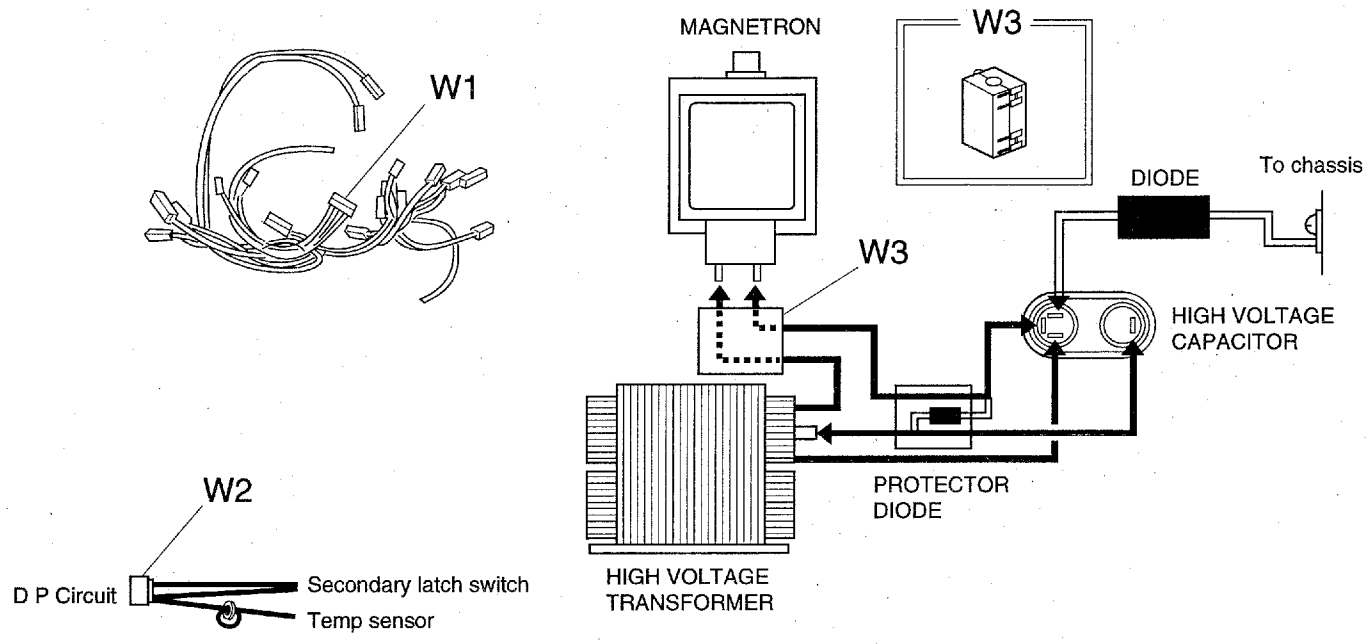
PACKING AND ACCESORIES



(S-753H ZPG)

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
P1		A000B8240ZP	COOK BOOK	1	
P2		A00037530ZP	INSTRUCTION BOOK	1	
P3		A01027530HZP	PACKING CASE,PAPER	1	
P4		A01047200HN	UPPER FILLER	1	
P5		A01057200HN	LOWER FILLER	1	
P6		A01064830AP	VINYL COVER	1	
P7		ANE01072Q0AP	DOOR SHEET	1	
P8		A01086520EP	TRAY PACKING	1	
P9		A01136520GP	TRAY STYROL	1	
P10		A01117530ZP	G LABEL	1	
P11		A06017210QP	COOKING TRAY	1	
P12		A06025870UP	OVEN RACK	1	
P13		A01457530XN	DOOR SHEET B	1	
P14		A00106000ZP	TIMER CAUTION SHEET	1	
P15		A01264800XN	REINFORCE MATERIAL	1	

WIRING MATERIAL



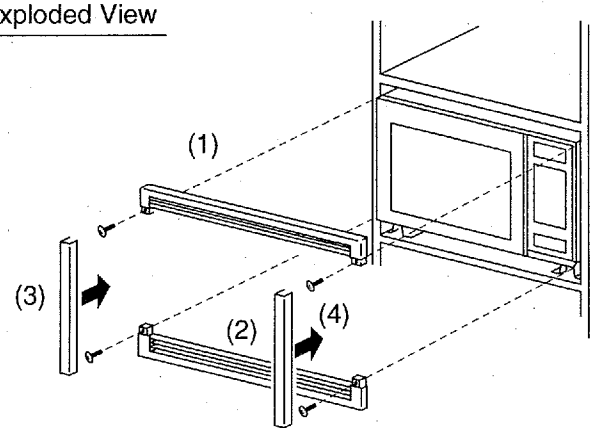
(S-753H ZPG)

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
W1		A030A7530ZP	LEAD WIRE HARNESS	1	
W2		A03536520GP	LEAD WIRE	1	
W3		A50966520UP	FERRITE CORE	1	

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
REF NO. 77 NOISE FILTER (U)					
C1		ECQU2A104MN	POLYESTER CAPACITOR	1	0.1MF,250V,±20%
C2,3	⚠	ECKDNS472ME	CERAMIC CAPACITOR	2	0.0047MF,250V,±20%
F1		A62316010BP	FUSE HOLDER	2	
L1		ANE621A7B0JN	FILTER COIL	1	
R2		ERD25FJ564S	CARBON FILM RESISTOR	1	560KΩ,1/4W,±5%
ZNR1		ERZC10DK621F	VARISTOR	1	
ZNR2,3		ERZC10DK112A	VARISTOR	2	

PARTS LIST FOR MICROWAVE OVEN TRIM KITS

Exploded View

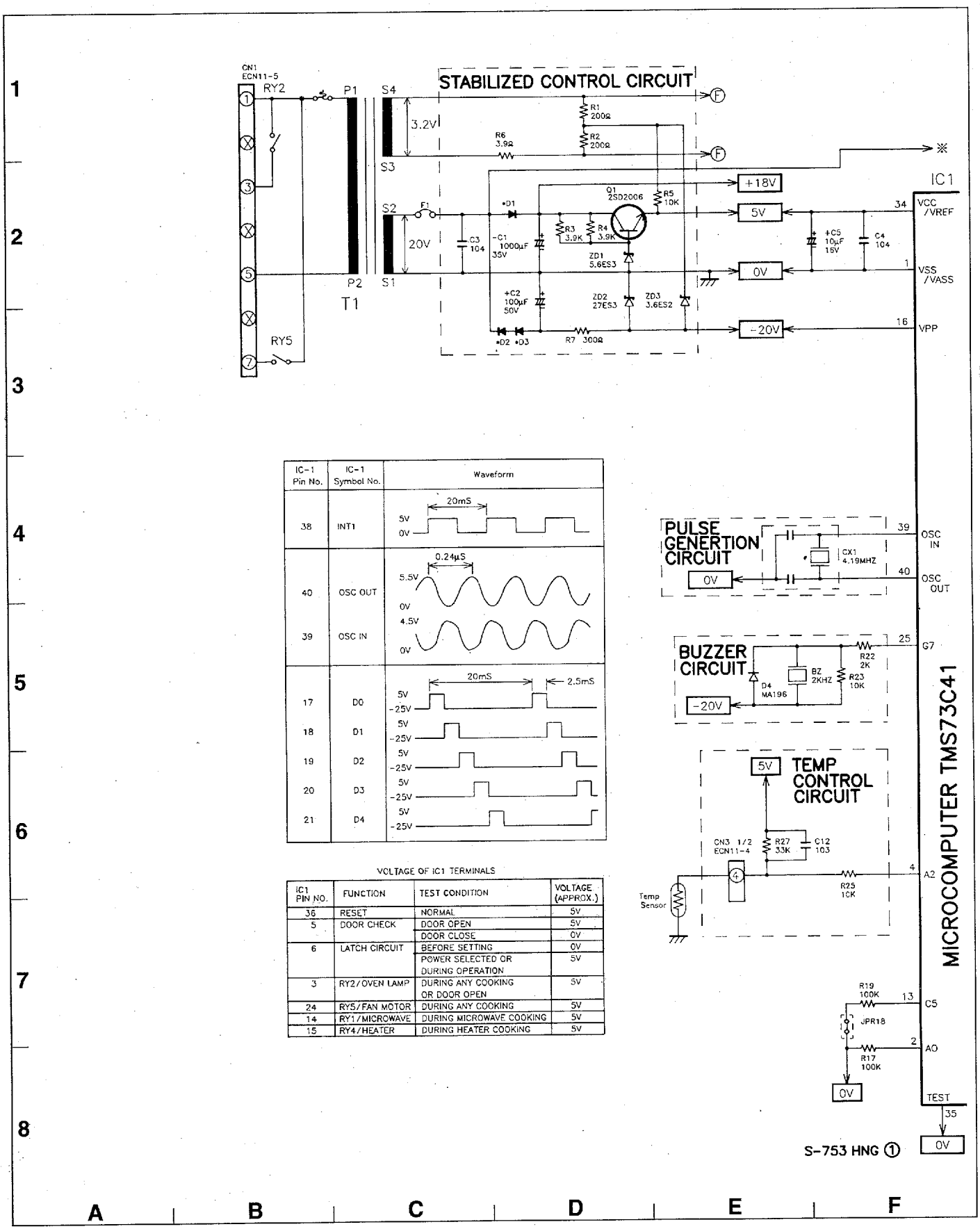


Trim kit Model No.	Top and Bottom Strip Ref No:1.2	Pcs/ Set	Side Strip Ref No:3.4	Pcs/ Set	Microwave Oven Model No.
NN-TK752	A1603A290HGP	2	A1601A290HGP	2	

NOTE: The top and bottom strips have the same part number and the left and right side strips also have the same part number. These parts will be supplied on one piece per one part number.

DIGITAL PROGRAMMER CIRCUIT

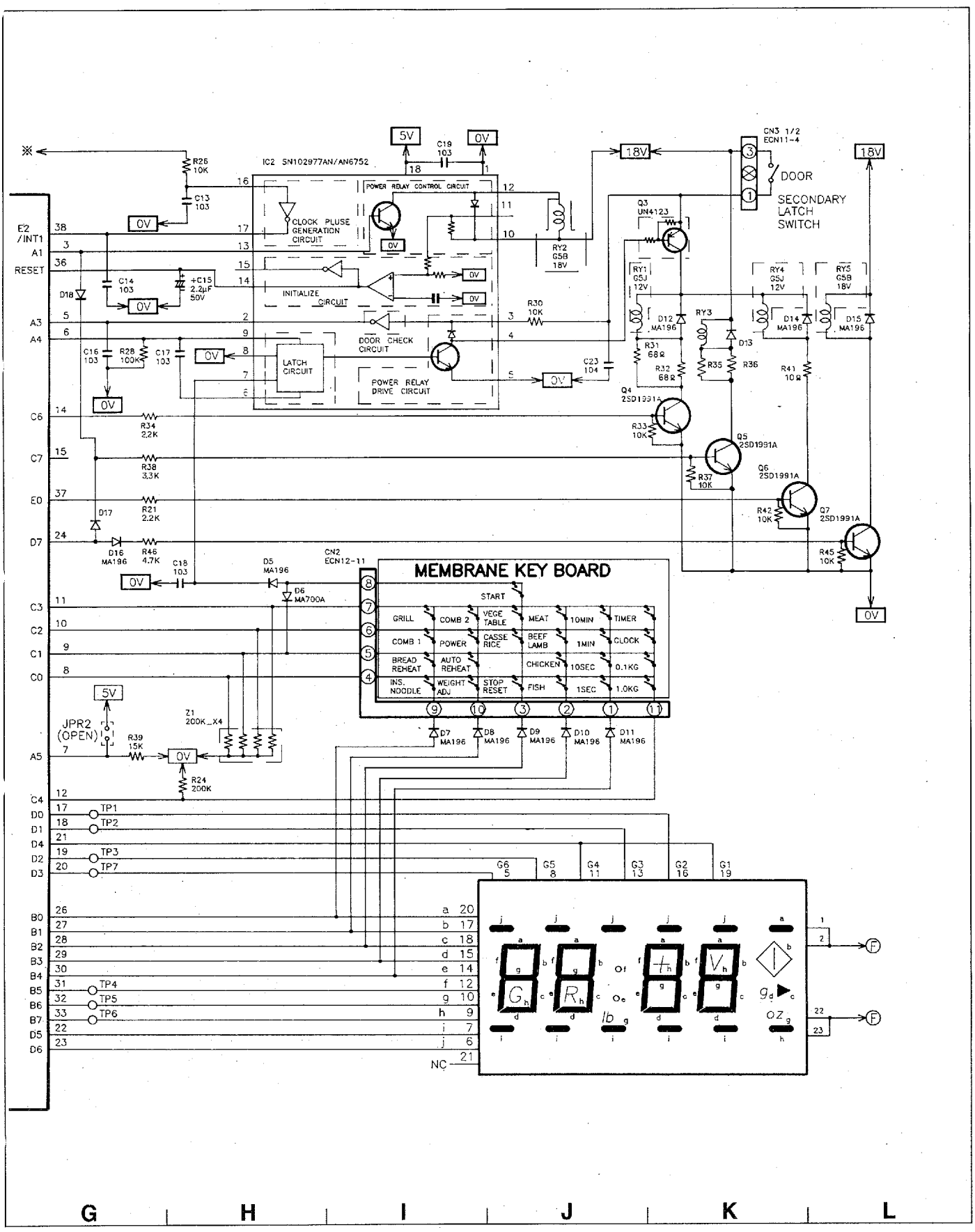
SCHEMATIC DIAGRAM



IC-1 Pin No.	IC-1 Symbol No.	Waveform
38	INT1	20mS, 5V, 0V
40	OSC OUT	0.24μS, 5.5V, 0V
39	OSC IN	4.5V, 0V
17	D0	20mS, 2.5mS, 5V, -25V
18	D1	5V, -25V
19	D2	5V, -25V
20	D3	5V, -25V
21	D4	5V, -25V

VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
36	RESET	NORMAL	5V
5	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSE	0V
6	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
3	RY2/OVEN LAMP	DURING ANY COOKING OR DOOR OPEN	5V
24	RY5/FAN MOTOR	DURING ANY COOKING	5V
14	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V
15	RY4/HEATER	DURING HEATER COOKING	5V


IC2 SN102977AN/AN6752
POWER RELAY CONTROL CIRCUIT
CLOCK PLUSE GENERATION CIRCUIT
INITIALIZE CIRCUIT
DOOR CHECK CIRCUIT
LATCH CIRCUIT
POWER RELAY DRIVE CIRCUIT
MEMBRANE KEY BOARD
START
GRILL
COMB 2
VEGE TABLE
MEAT
10MIN
TIMER
COMB 1
POWER
CASSE RICE
BEEF LAMB
1MIN
CLOCK
BREAD REHEAT
AUTO REHEAT
CHICKEN
10SEC
0.1KG
INS. NOODLE
WEIGHT ADJ
STOP RESET
FISH
1SEC
1.0KG
DOOR
SECONDARY LATCH SWITCH
JPR2 (OPEN)
Z1 200K_X4
TP1
TP2
TP3
TP4
TP5
TP6
TP7
5V
0V
18V

DIGITAL PROGRAMMER CIRCUIT

PARTS LIST

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
BZ	AEFB22EP20TL	BUZZER	1	2.0KHZ
C1	ECEA1VU102E	ELECTROLYTIC CAPACITOR,AL	1	1000MF/35V
C2	ECEA1HU101B	ELECTROLYTIC CAPACITOR,AL	1	100MF/50V
C3,4,23	AECF50F104Z	CERAMIC CAPACITOR	3	0.1MF/50V
C5	ECEA1CKA100B	ELECTROLYTIC CAPACITOR,AL	1	10MF/16V
C12,13,14, 16,17,18,19	ECBT1E103ZF5	CERAMIC CAPACITOR	7	0.01MF/25V
C15	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR,AL	1	2.2MF/50V
CN1	AEEMMA05507W	CONNECTOR	1	7PIN
CN2	AEEM11FDZBTM	CONNECTOR	1	
CN3	AEEMMC00D04W	CONNECTOR	1	4PIN
CX1	AEFFT4R19GWT	CERAMIC RESONATOR	1	4.19MHZ
D1,2,3	AEDNERA1502	DIODE,SI	3	(1.0A)
D4,5,7,8,9,10, 11,12,13,14, 15,16,17,18	MA196-(TA5)	DIODE,SI	14	(0.1A)
D6	MA700A-(TA)	DIODE,SI	1	(0.03A)
DISP	A64566520GP	FLUORESCENT TUBE	1	
IC1	AEICC4177047	L.S.I	1	
IC2	AN6752	IC	1	
Q1	2SD2006QRTA	TRANSISTOR,SI,1.2W	1	120MHZ
Q3	UN4123-(TA)	TRANSISTOR,SI,300MW	1	
Q4,5,6,7	2SD1991AQSTA	TRANSISTOR,SI	4	
R1,2	ERDS2TJ201T	CARBON FILM RESISTOR	2	200Ω,1/4W 5%
R3,4,46	ERDS2TJ472T	CARBON FILM RESISTOR	3	4.7KΩ,1/4W,5%
R5,23,25,26, 30,33,37,42,45	ERDS2TJ103T	CARBON FILM RESISTOR	9	10KΩ,1/4W,5%
R6	ERDS2TJ2R2T	CARBON FILM RESISTOR	1	2.2Ω 1/4W 5%
R7	ERDS2TJ301T	CARBON FILM RESISTOR	1	300Ω,1/4W,5%
R17,19,28	ERDS2TJ104T	CARBON FILM RESISTOR	3	100KΩ,1/4W,5%
R21,34	ERDS2TJ222T	CARBON FILM RESISTOR	2	2.2KΩ,1/4W 5%
R22	ERDS2TJ202T	CARBON FILM RESISTOR	1	2KΩ,1/4W 5%
R24	ERDS2TJ204T	CARBON FILM RESISTOR	1	200KΩ,1/4W,5%
R27	ERDS2TJ333T	CARBON FILM RESISTOR	1	33KΩ,1/4W 5%
R31,32	ERDS2TJ680T	CARBON FILM RESISTOR	2	68Ω,1/4W 5%
R38	ERDS2TJ332T	CARBON FILM RESISTOR	1	3.3KΩ,1/4W 5%
R39	ERDS2TJ100T	CARBON FILM RESISTOR	1	15KΩ,1/4W 5%
R41	ERDS2TJ153T	CARBON FILM RESISTOR	1	10Ω,1/4W 5%
RY1,3,4	⚠AEG5J1EM12B	POWER RELAY	3	(12V)
RY2,5	⚠AEAWJZDC18A	POWER RELAY	2	(18V)
SPACER	A82845570AP	SPACER CUSHION	1	FOR DISP
T1	⚠ETP41KGN81BP	L.V.TRANSFORMER	1	
Z1	AEXBM4X204JT	COMPOUND-RESISTOR	1	200KX4
ZD1	AEDZ5R6ES3T1	ZENER DIODE,SI	1	
ZD2	AEDZ27ES3T1	ZENER DIODE,SI	1	
ZD3	AEDZ3R6ES2T1	ZENER DIODE,SI	1	
ZNR	ERZC10DK621F	VARISTOR	1	

Ref. No.	Part No.	Description	Pcs/ Set	Remarks

SERVICE FIXTURES AND TOOLS

EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
	AT40M004	4 pin Extension Cable	1	Cable No. 16
	AT40E006	1 pin X 6 Extension Cable	1	Cable No. 9
	AT40M007	7 pin Extension Cable	1	Cable No. 37

DPC COMMON CHECKER AND ITS CABLE

NOTE: To be used only when DPC common checker is available.

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
	ANE600ZK70GP	DPC. Common Checker	1	
	AT30A6520AP	DPC. Checker Cable	1	NOTE

WP-540
S-753H ZPG
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